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No. X.

## UNIVERSAL DRILL-STOCK.

*The SILVER MEDAL was presented to Mr. MORGAN EVANS, 23 Wellington Street, Woolwich, for his Universal Drill-Stock; a Model of which has been placed in the Society's Repository.*

Woolwich,

15th January, 1840.

SIR,

I ENCLOSE you here Mr. Morgan Evans's description of his Universal Drill-Stock. I am not sufficiently acquainted with the practical use of the drill, but as far as I can judge, I cannot help thinking it a very ingenious, and in many situations, a useful instrument. I am sorry that a particular engagement will prevent my being present at the meeting of the Committee to-morrow evening.

I am, Sir, &amp;c. &amp;c.

W. A. GRAHAM, Esq.

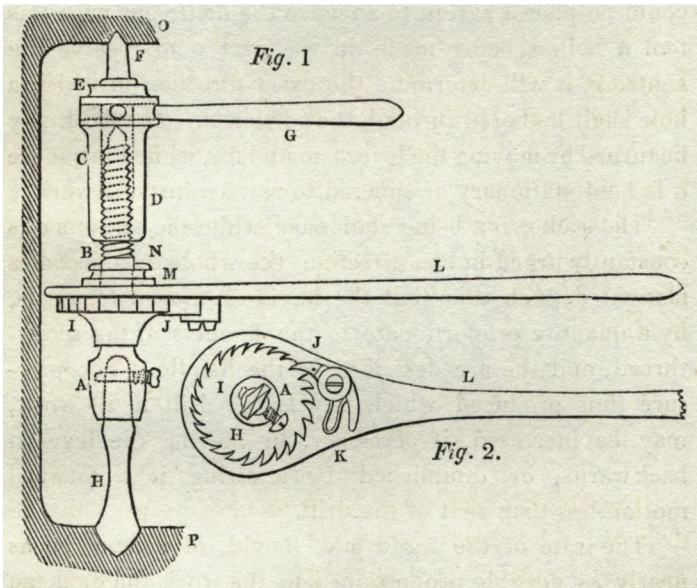
P. BARLOW.

Secretary, &amp;c. &amp;c.

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The object of this machine is to enable a workman to drill holes in metal or wood, in any situation, in any direction, and of any size. The inconvenience of the common drill-stock is, that it cannot be used in confined situations, for want of room to work the bow. In these cases, therefore, recourse is obliged to be had to other means, such as employing a square stock with a shifting wrench, or other contrivance; moreover, no convenient

means are provided for bringing on the pressure upon the drill. Both these defects are provided against in this instrument: first, by means of a screw at the top of the stock, the pressure may be regulated at pleasure, and by means of the ratchet the handle may be thrown back without losing its connexion with the stock; at the same time, the screw at the top, turning back with the lever, relieves the drill from its pressure, to be again repeated on the forward stroke. A pulley is provided for working with a bow, in situations that will allow of its being so employed.



The stock is constructed so as to elongate itself, by small degrees, during the act of boring, and by that means to force the drill forwards to its work.

For this purpose, the back end of the stock A, fig. 1, from B to C, is made into a screw, and on it is fitted the

hollow screwed socket  $D E$ , which is furnished with a back centre  $F$ , and has holes to receive the lever  $G$ ;  $H$  is the drill, and  $I$  a ratchet-wheel fixed on the stock. The click  $J$  is kept in contact with the wheel as shewn in the front view fig. 2, by a light spring  $K$ , which allows the lever  $L$  to move back without the drill, but when it is moved forwards the drill turns with it, the click being mounted on the lever; this lever moves freely on the stock under the collet  $M$ , and both are kept in place by the pin  $N$ . The section lines  $O P$  inclose a space only wide enough to introduce the stock and drill, consequently no other screw could be placed within to advance the drill; but with this tool a hollow being made in the part  $O$  to receive the centre  $F$ , it will determine the exact direction in which a hole shall be bored through the portion  $P$ . The drill may be turned by moving the lever  $L$  to and fro, while the handle  $G$  is held stationary or suffered to rest against the work.

The socket  $D E$  being stationary, while the screw  $B C$  is constantly urged in one direction, the whole axis becomes elongated, each time that the handle is moved forwards, by a quantity proportionate to the fineness of the screw-thread, and the arc described by the handle. The pressure thus produced, which impels the drill to its work, may be increased, if necessary, by moving the lever  $G$  backwards, or diminished by allowing it a forward motion less than that of the drill.

The rate of the screw  $B C$  should, of course, be as nearly as possible proportioned to the work the drill can perform; and should a hole be required deeper than the range of the screw and socket, a second or third drill, of greater length, may be used in succession. As a long axis or stock will guide the drill better than a short one, this tool has the advantage of being always of the greatest

length the space o p will admit. In cases where there is no portion of the work to form a back centre, it can be obtained by clamping one to any convenient part of the work.

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## No. XI.

## EXPANDING MANDREL.

*The SILVER MEDAL was presented to Mr. JOHN HICK, Junior, of Bolton, Lancashire, for his Expanding Mandrel for Turning Lathes; a Model of which has been placed in the Society's Repository.*

SIR,

London, 27th March.

I BEG leave to offer for the acceptance of the Society my expanding mandrel, which I believe to be quite new, and shall feel proud if the Society think it of sufficient merit to entitle me to any honorary reward.

I am, Sir, &amp;c. &amp;c.

*To the Secretary of the  
Society of Arts.*

JOHN HICK.

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There are in the construction of steam-engines, mill-gearing, &c. a great number of parts, such as steps for plummer-blocks and other pedestals, also for connecting-rods, cross-heads, &c., bushes for piston-rods, and a variety of other parts which require their outer diameters to be turned true, or concentric, with the hole through